

Name: \_\_\_\_\_

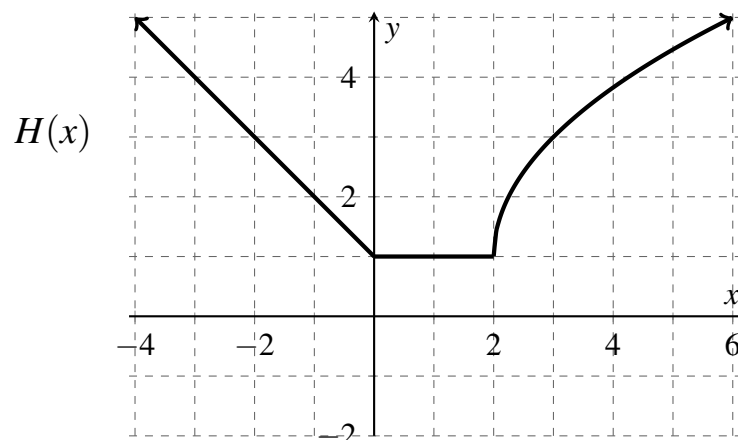
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There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. (8 points) **Use the definition of the derivative** (provided below) to find the derivative of the function  $f(x) = \frac{2}{3x}$ . No credit will be awarded for finding the derivative via other methods.

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

2. (4 points) The function  $H(x)$  is graphed below. Sketch the graph of  $H'(x)$ , the derivative of  $H(x)$ , on the same set of axes.



3. (9 points) Find  $f'(x)$  for each function below. You do not need to simplify your answer.

(a)  $f(x) = 8x^3 - 2\sqrt{x} + \sqrt{3}$

(b)  $f(x) = (x + 1)\cos(x)$

(c)  $f(x) = \frac{\sin(x)}{5x-4}$

4. (4 points) The function  $F(t)$  models the temperature in degrees Celsius of a cabin  $t$  minutes after a wood stove has been lit.

(a) Interpret  $F(20) = 5$  in the context of the problem.

(b) Interpret  $F'(20) = 1$  in the context of the problem.